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SCHOOL AND SOCIETY

EDITED BY J. McKEEN CATTELL

Volume XXXI | SATURDAY, MAY 24, 1930 | Number 804

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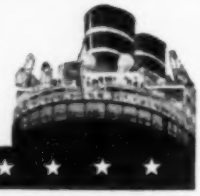

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EDITED BY WILLIAM McANDREW

Volume XXXI | SATURDAY, MAY 24, 1930 | Number 804

A RELATIONSHIP BETWEEN THE PSYCHOLOGY OF LEARNING AND THE PSYCHOLOGY OF TESTING[1]

By Dr. LEONARD CARMICHAEL

PROFESSOR OF PSYCHOLOGY, BROWN UNIVERSITY

IN our colleges and universities investigators and teachers whose concern is with the general study of psychology are often separated by departmental or even school lines from those who are occupied with the development and application of mental tests. This situation is natural enough. I see no reason to advocate that it be changed. It is unfortunate, however, if an artificial crevasse of this sort be dug so wide and deep that important facts fall to its bottom and lie neglected. This morning I suggest that we consider certain facts that may be dredged forth from this divisional canal.

With your permission I propose first to remind you of certain fundamental facts of the psychology of learning, then to call your notice to some basic conditions in the psychology of testing and then to suggest a relationship which exists between these two sets of facts and to indicate some applications which may be made of the facts considered.

During the present century great advances have been made in the knowledge of the psychology of learning, and particularly in the physiological psychology of learning. More and more it has become evident that all acquisition by the individual is to be considered as a modification and as a synthesis of the existing capacities of the organism in question. The demonstration of the practicability of conditioning simple reflexes by certain continental experimental physiologists gave added sanction to much similar work on more complex types of learning that was independently developing in American psychological laboratories. Fundamental to all this work, it has become increasingly evident, is the fact that conditioning, as indeed all learning, depends upon the modification of the existing capacities of the individual.

That an understanding of present behavior is essential if behavior is to be changed is directly demonstrated in much work in animal psychology. Some years ago in the psychological laboratory of Harvard University Professor Yerkes showed that it was possible to train one of the humblest of all organisms possessing a central nervous system, the earthworm. More recently part of this work has been repeated in my laboratory. Before the train-

[1] An address delivered before the Harvard Teachers' Association.

ing of this lowly organism can begin, it is necessary to find out what its present abilities are. If it is desired to teach the worm to turn always to the right—and what more exalted objective in the philosophy of earthworm education can be established than this?—it is necessary to know quite a good deal about the worm before the process of education may effectively be undertaken. It is important to know what changes in the environment will make the worm active, for the worm learns only by doing. The worm must be motivated. It is necessary to be informed of the fact that if a worm receives a slight electric shock it will turn aside and move in another direction. It is essential to determine whether or not the particular worm in question is already so organized that it will turn to the right at an intersection without instruction. If we do not assure ourselves concerning the latter fact before the experiment begins, we may falsely flatter ourselves as teachers—a condition, I may add parenthetically, which sometimes exists in the education of organisms more complex than the earthworm. It is easy to think that we are teaching an already right-turning worm to turn to the right, or a professor's daughter to use grammatical English.

If we are to teach effectively and evaluate correctly the results of our training of the worm to turn, therefore, we must know what the worm can do before we begin to teach it, including, of course, those factors which will make him active in the learning situation. We must, in this case as always, observe and, indeed, test the individual so as to discover the existing traits which may then be modified and reorganized.

This same fact is true in regard to the basic learning of higher animal organisms. If we wish to train a white rat to run without errors through an elaborate maze, we must first of all discover what the animal in question can do. What are the conditions under which the rat will be active? What are the conditions which may be used to bring about a change in its behavior so that eventually a desired series of responses, as determined by the experimenter or teacher, will be given and the undesirable and inappropriate responses eliminated? In order to answer these questions the present ability of the animal itself must be studied and tested.

In an artificially simple case of human learning in the laboratory, such as the development of the conditioned knee-jerk to the sound of a bell, it is again essential, before the work of conditioning proceed, for the experimenter or teacher to know a number of things. He must determine that the subject can hear the bell. He must know that the subject's leg will jerk out when a hammer hits the tendon just below the knee. It is also essential to know that the sound of the bell produces no leg movement in the subject before the experiment begins. If these facts are ascertained by appropriate tests, then, by the employment of suitable techniques, it can be brought about, as you know, that eventually the subject will kick his leg when he hears the bell but when the hammer no longer strikes his knee. When this bell-knee-jerk response occurs, we may say that learning has taken place by the recombination of abilities previously known to be possessed by the subject. Effective teaching was possible because the simple capacities of the individual were understood. As a matter of fact, one of my colleagues at Brown University, Dr. Schlosberg, in certain very elaborate experiments on the conditioned knee-jerk, in which I have had some small part, has shown that the change of this function is not always quite so simple as the description just given might lead one to suppose. The complicating determiners are apparently due to the fact that there are certain essential conditions of the subject, particularly in regard to his

so-called emotional responses, which are not known when the experiment begins. Successful teaching results from knowing the individual; failure to teach often results from ignorance of the individual.

If we turn to a more complex function in the human being, we may take a child who, when confronted by the symbol 2, we discover by trial, makes no appropriate responses. If, however, by very simple tests we come to know that he can see the 2, and that he can also count real objects up to ten or more, we can then appropriately teach him to respond by the vocal word "two" when the symbol in question is presented. Eventually under certain circumstances we may also teach him to think the word "two" when the symbol is put before him. This is possible because the capacities were known before learning began.

"Certain soporifics come from papaveracious plants," I may tell you. My statement has been teaching if before the instruction began you were able to give me the meaning of the word "soporific" and of the word "papaveracious," but my statement has not been effective teaching if either or both of these capacities were not possessed by you. It would be possible for me to be sure in regard to the methods of teaching you about papaveracious plants only if I could adequately discover your individual responses in regard to the elements of this learning before the synthesizing act of teaching begins.

If you prefer to think of learning in terms of the vocabulary of the *Gestalt* or configurational psychologists, it seems to me that the same essential facts that we have just been considering still present themselves. It is true that certain critical American psychologists believe that when the facts of learning are presented in this system of psychology they appear, but rather through a glass and somewhat darkly. However this may be, it seems assured that in "insightful" learning we have an example of the reorganization of old abilities. When an ape, for what is said to be the first time, uses a stick, tool fashion, to rake in a banana otherwise out of reach because of his cage, we have a novel performance which depends upon certain previously possessed capacities. Before the reorganization of abilities, or in this case possibly what has been termed their "closure," takes place, the animal, if tested, would show a capacity to deal with bananas, and a capacity to deal with sticks, each in independent situations. In this example anthropoid learning consists in the novel assimilation and organization of patterns of behavior. Effective teaching in this case, as in the others that we have considered, depends, however, upon a knowledge of what the capacities of the individual are before teaching begins.

If we now turn from the subject of learning to the subject of testing, we may see at once that basic to every test procedure is the determination of some aspect of the present capacity of the individual. This is the same fact that we have just been presenting as most important in the fundamental psychology of learning.

Basically, all tests which may be called mental are procedures intended to determine something of the psychological make-up of the individual as it is at the time that he is tested. Give an individual a Kelley Mathematical Values Test, and you are testing some of his capacities as they then exist. Softly touch the sole of the foot of a new-born baby and observe his behavior, and you are testing him. Because of the almost infinite variety of tests, some system of classifying them is necessary. The scheme of classification is in itself, of course, unimportant. It is merely a system to assist an individual with particular interests to handle an otherwise unwieldy mass of material. To-day, for example, for convenience' sake, we may say

that there are two great groups of tests, informal and formal, although this dichotomy, as is at once apparent, is by no means a hard and fast one.

Under the heading of informal tests may be grouped all procedures, such as casual interviewing and unstandardized questioning and rating, by means of which the tester attempts to find out something concerning another individual as that individual is at the time that he is being tested. Such procedures usually depend on the uncodified past experience of the examiner. It has been shown a number of times that a highly trained individual using this method may achieve important results. Indeed, as Professor Dearborn has recently pointed out, training the informal examiner in the procedures of rating may greatly improve the validity, as determined by some more objective criterion, of such informal and "intuitional" testing. For the purposes of the present discussion, however, I merely wish to emphasize the fact that, in the interview and other types of informal testing, the examiner is more or less successfully finding out what the individual does at the time that he is being tested. All other conclusions drawn in regard to the candidate by the examiner are necessarily inferential. He may say, "This man now has the following abilities," and then add, "He should be employed or promoted." The first is a statement of a fact of observation; the second an inference based upon the particular informal tester's past experience with other candidates.

If we now turn to the complex field of formal tests, we find essentially the same basic condition. Formal tests are more frequently classified according to the purposes which they are constructed to accomplish than according to the processes which they actually measure. Such tests are frequently divided into (1) tests of proficiency and (2) tests of aptitude.

If we accept this classification, we may take as typical of tests of proficiency all educational or trade tests which are in any sense standardized. It is obvious that such tests aim to measure the present behavior of the individual, and thus indirectly to evaluate some complete aspect of the capacities of the individual as they appear after the individual has been subjected to the protoplasmic-changing process of education, in school or shop. A completely adequate proficiency test must necessarily include a test of every function of the individual that is concerned in the particular skill being tested. Some proficiency tests quite nearly approximate this aim. This is particularly true of certain tests of skill in using a calculating machine or typewriter. Proficiency tests, however, often become highly inferential when they must make use of samples of proficiency in order to evaluate some total proficiency. When in order to discover whether a child has the ability to spell I ask him to spell a few words and then generalize in regard to his spelling proficiency, I am making an inference. The validity of this inference will be increased if it is based on statistically evaluated past experience with many similar children and many similar words. One who is testing, however, must keep clearly before him the fact that, when certain words are correctly spelled and he therefore says that according to the Ayres scale the child has a fourth-grade ability in spelling, he is making a somewhat complexly determined inference, and he is not stating a fact of observation.

When we turn to the so-called tests of aptitude we find, to be sure, that in no case is it possible to test directly the so-called aptitude. When we say that tests of the physical, motor and sensory traits of the individual all are aptitude tests, we are simply saying that if we can test the strength of grip, speed of tapping and visual acuity, or any other ability of the

individual as he is when he is tested, we may make some prediction in regard to his future performance in these functions. In each case, however, we are only directly discovering what the individual can do at the time that he is tested. Any further statement in regard to the result of the test is an inference and not an observed fact. Some of these inferences, however, may be made with great certainty for groups by the statistical treatment of a large number of cases in varying situations. We may confidently expect, on the basis of past experience, a much greater change in the strength of grip than in visual acuity as the years pass between five and fourteen.

When we turn to the complex aptitude tests, however, we find that we are forced to build a still more indirect inferential structure. In the so-called general intelligence tests, or as most such tests may be called without injustice, scholastic aptitude tests, in the mechanical aptitude tests and in the artistic aptitude tests, we are still only directly dealing with the responses that an individual makes at the time that he is tested. We are never directly testing power, alertness, brightness, interest, inherited intelligence or inborn talent, as such. We are merely directly discovering what the individual can do at the time tested. If we have chosen a capacity that all individuals have had an equal chance to acquire, and if we find differences, we may predict that those who have acquired most in the common situations of the past will acquire most in the common situations of the future, but this is an inference, and sometimes an incorrect one. Tests only directly test what the individual can do at the time tested.

We have now reviewed one fundamental series of facts in regard to the psychology of learning, as they appear in modern experimental work. We have also seen one fundamental series of facts in regard to the psychology of testing. The facts of learning that have been considered and the facts of testing that have been treated are directly related. Learning depends upon the modification of the individual's capacities as they exist before learning begins. Testing measures the individual's capacities as they are at the time tested. Thus directly the result of testing is to provide that knowledge which is directly essential for the actual teaching of an individual.

Strange as it may seem, however, in much actual practice only a small fraction of the material that is really available, as the result of testing, is ever used in the process of teaching. Most scholastic aptitude or general intelligence tests, for example, contain vocabulary tests. As a result of the performance on the vocabulary items as well as on many other items, a particular score is given to the individual who has been tested. The responses to the items themselves are forgotten. This procedure may often be necessary. Is it irrelevant, however, to suggest that one who does more than pay lip reverence to the fact that all education must be based upon the knowledge of the individual can find in the vocabulary test an indication of the range of the particular pupil's verbal responses in a way that may not be covered in any other test? The knowledge of the individual gained from the study of all the tests taken by that individual which concern language may be used most effectively in fitting present instruction to the needs of the individual.

One who has had anything to do with the test materials that are collected, for example, in educational surveys, realizes that a glance at some single pupil's paper is often a revelation in regard to some single boy or girl's individual intellectual characteristics. Pick out at random from the hundreds of booklets a single standard achievement test. Look it over. It may be that you will find in the quiet of your office, possibly removed by many miles from the

turmoil of the actual classroom, that Dorothy can deal quite well with most of the fundamental operations of arithmetic save simple fractions. An interesting fact, you think, as you slip the booklet back into its alphabetical place. But this does little to help Dorothy add five sixteenths and eleven nineteenths. Nor does the test booklet in your office keep Dorothy's teacher from explaining the problems in some project in geography by the use of what are for Dorothy the still mysterious fractions.

Two groups of like-aged children, one of very superior and one of average ability, as shown on scholastic aptitude tests, differ markedly also in reading ability. Recent studies by Garrison and others show that in general the relative difference in reading ability, in such groups, that is apparent in the third grade is still apparent in the ninth grade. This is an interesting and certainly not unexpected fact. An observation that may easily be overlooked in this result, however, is its application at ten o'clock on Thursday morning in the reading class. Archibald of the superior group has certain readily formed verbal capacities which may be modified and synthesized in the experience of the Thursday lesson. Tobias of the average group, however, does not have these same present capacities. This fact is more important in the reading class on Thursday morning than is the assumed fact that Archibald will learn more rapidly in any case because he has a higher intelligence quotient, although both facts may be gleaned from the same test.

In the absence of effective non-physical telepathy the facts of what the individual is capable of can be known only by testing of some sort. Certain tests are always available to the teacher, and these, of course, yield the bulk of the available information in regard to the capacities of the individuals in the class. For most purposes the regular schoolroom tests may suffice. Is it a counsel of perfection, however, to suggest that it is unfortunate that not all relevant test material is available for the instrumental use of one who wishes to be an actual teacher of individuals and not of classes?

One who is concerned at all in the construction or administration of tests is continually asked whether or not he believes that the individual teacher should be allowed to know the test scores which concern the teacher's class. We all know that unfortunate results may follow, in certain cases, from the indiscriminate presentation of these magic numbers, carrying with them, unfortunately, as they do, often, an air of almost Calvinistic predestination. How different would be the case, however, if, instead of the often dangerously prejudicial quotients or score numbers, the actual replies on the test could be made available. In school and, indeed, in college, by this means the teacher might discover, for example, that his failure to motivate a boy in an introductory course, let me say for example in psychology, is due to the fact that the illustrations used in the classroom, based upon a certain assumed general fund of mechanical information, are really falling upon two functionally deaf ears, because all the aptitude tests taken by the boy in question show that he has failed each item in the tests that is concerned with mechanics.

This direct and detailed use of the replies made in general tests may not be possible in the regular routine of teaching as it is organized to-day. One can not teach hundreds of individuals and still puzzle over each particular reply made by each pupil in his so-called aptitude and achievement tests. Often it may seem hard enough to the teacher to take the time necessary to use a stencil and mark the incorrect items in such tests, let alone attempting to remember where and why each child is wrong. This fact does not prove, however, that in some ideal Platonic state

teachers may not have leisure to believe that there is a scientific and direct relationship between learning and testing. When this relationship is known it will be obvious that a complete knowledge in all available ways of the individual is valuable if the dynamic process of reintegration and reformulation of old abilities into new achievements is to be possible in each individual with Utopian effectiveness. But even now, while Massachusetts is still not in all respects the perfect Golden Athens, nor Rhode Island the New Atlantis, it is possible that some suggestions toward a more effective teaching procedure may be secured by remembering that there is a scientifically known and fundamental relationship between certain basic conditions of learning and certain fundamental facts of testing.

Test. Use test results realistically. Then teach.

THE GROWTH OF INTELLIGENCE AT THE COLLEGE LEVEL[1]

By Dr. AGNES L. ROGERS

PROFESSOR OF EDUCATION AND PSYCHOLOGY, BRYN MAWR COLLEGE

POPULAR opinion on mental development is a crude mixture of fact and fancy. The difficulty of isolating the increase of intellectual power due to innate mental maturity from that due to the acquisition of knowledge and skill makes it easy to understand why the development of intelligence at the college level is still a matter of conjecture rather than conviction. Yet there is as great a need to have facts scientifically established at this as at earlier levels, and for the same reasons. The more accurate our knowledge of the mental capacities of students is, the more successful we shall be in adapting instruction to their requirements. It is probable that for many there is little continuity between high-school and college courses, and this concerns the educative process in all its aspects, affecting methods of instruction as well as selection of content. Experience is an insufficient guide. Even if all the experience of all college teachers were analyzed and combined, it would still hardly provide a general theory and technique for college education. We would still lack knowledge of facts demonstrably true and generally significant.

Meantime, reconstruction has gone on apace. Already in the West the junior college has obtained a firm footing in the educational scheme. In the East it has appeared both as an extension of the high-school course and as an independent institution. Within the walls of academic institutions, resistant to change, the work of the first two college years has been made significantly different from that of the last two years. The honors plan, bringing fundamental changes, is being introduced to an increasing extent in colleges and universities in all parts of the country.

Progress has been made in our knowledge of adult learning by Thorndike, whose book on this subject represents an important contribution to knowledge. His treatment, however, of learning by persons of superior intellect is confined to those who have missed the opportunities enjoyed by college students. Learning experiments are reported by him giving results for adult prisoners, adults in evening high schools and in secretarial schools. It would be rash to draw conclusions from such data as to what might be expected of a college group.

[1] An address delivered before the Harvard Teachers' Association.

An investigation, concerned with our problem, in which college students were the subject of study was conducted by Cowdery,[1] at Leland Stanford University. The Thorndike Intelligence Examination was used on two occasions. Nineteen students were retested after a period of less than a year, 104 after an interval of one year, 59 after an interval of two years and 25 after an interval of three years. The significance of the changes found he held to be doubtful, partly because they were so very slight in amount and partly because a difference in the students' attitude towards the test on the two occasions probably acted as an interfering factor. The first examination was competitive, with admission to the university at stake, and hence the spur to effort was great. The second examination was merely a required exercise in a psychology course. The incentive to endeavor was likely to be slight. This difference alone would account for the very small increase in scores. The alteration in the conditions on the two occasions detracts from the significance of the results.

The purpose of the investigation to be reported was to determine whether intelligence scores increase at the college level, in order to ascertain whether college women attain intellectual maturity at eighteen or at a later age, and in particular, to discover which of the abilities measured by the instrument applied continued to improve beyond eighteen.

The subjects of study were members of the 1928, 1929 and 1930 classes at Bryn Mawr College. This is, even for college students, a highly selected group. Data from three comparable institutions indicate the extent to which selection, on the basis of mental alertness, as measured by the Thorndike Intelligence Examination, prevails.

[1] K. M. Cowdery, SCHOOL AND SOCIETY, 27: 367, March 24, 1928.

TABLE I

THORNDIKE INTELLIGENCE EXAMINATION AVERAGE SCORES FOR COLLEGE GROUPS

Institution	A.M. of intelligence score	S.D. intelligence scores
Bryn Mawr, 1924–28	88	10.72
Bryn Mawr, 1925–29	86	10.3
Bryn Mawr, 1926–30	86	7.9
Columbia College—Freshmen admitted	81	13.3
Smith College, 1924–28	78.9	12.9
Stanford University men, 1921	74	14.5
Stanford University women	71	12.2

According to the standards given by the author of the examination, students having a score over 85 have intellect enough to do collegiate work and professional work with distinction, and are safe to admit to college even if poorly prepared. The Bryn Mawr classes studied had, in addition, passed the College Entrance Board examinations in the following subjects: an ancient language, English, mathematics, physics, history, French and German, or Greek, if not offered for the ancient language requirement. For these years admission to the college was competitive, students being chosen in the order of the excellence of their records. The earlier scholastic experience of these women must have been very similar. Seventy-three per cent. of them came from private schools. Such schools tend to be staffed by the graduates of similar institutions. Hence the similarity of the earlier training of these students was probably very great. They represent about as able and as homogeneous a group as one might hope to find. The chronological ages for one of these classes as given in Table II is typical of other years.

All these students in the first month of the freshman year were required to take the Thorndike Intelligence Examination. The reexamination held in December, 1927,

TABLE II

CHRONOLOGICAL AGES (1924–28 CLASS)

Chronological age	Number of students	Per cent. of students
Under 16	1	1.8
16–17	4	7.2
17–18	17	30.4
18–19	27	48.1
19–20	7	12.5
Total	56	

Average age 18½ years

was not compulsory. This report, therefore, is based on 56 seniors, or 69 per cent., of the class of 1924–28; on 35 juniors, or 53 per cent., of the class of 1925–29, and on 55 sophomores, or 50 per cent., of the class of 1926–30, who volunteered to take the second examination. These students had survived three, two and one year of college work, respectively. It should be stated that the average score in the first examination for those who did not take the second was not below the average of those who were retested. The causes of presence or absence at the second examination were numerous and varied, but degree of intelligence does not seem to have been one of these.

The test used, the Thorndike Intelligence Examination, includes twenty-one different kinds of tests. These are both verbal and non-verbal in character. They can be conveniently classified under eight heads, namely: linguistic, language completion, reading, mathematical, mechanical aptitude, information, reasoning and visual perception. Four measure linguistic ability, two language completion, four are reading tests, one is an information test, two are tests of visual perception. The other abilities are measured by one test each. The capacities covered are merely a selection of those that are exercised in academic work. Still this intelligence examination has a greater variety of tests than any other, covering twenty-one different kinds of tasks which the student is called upon to perform. Further, it measures difficulty rather than speed. There is reason to believe that the mental capacities it includes are significant in the college years, since the power of the test to predict success with academic work has been demonstrated. For Goucher College students the coefficient of correlation between test scores and freshman grades was .61.[2] For Columbia College men it was .65.[3] For Brown University freshman it was .53.[4] On the average, the test has been shown to predict freshman achievement by a correlation coefficient of .5 to .6.[2] The extent to which an intelligence test can predict academic marks is limited by the reliability of academic grades as well as by that of the test itself. One year's academic grades predicts that of another by not more than .7.[2] The correlation between the examination and academic grades, therefore, is substantial, and justifies us in thinking that the group of capacities measured can reveal directly, or indirectly, the development of important mental powers at the college age.

When the test was applied to a normal school group the reliability coefficient was .85.[5] For unselected eighteen year olds it would probably be perfect. Cowdery[6] found for 104 Leland Stanford University students who were retested after an interval of a year a coefficient of .75, and for nineteen students retested within a year, .89. The correlation coefficients for the Bryn Mawr study are lower, naturally, since the group is highly selected and the interval between the test and retest is

[2] Agnes L. Rogers, *British Journal of Psychology*, No. 4, April, 1925, p. 413.

[3] Ben Wood, "Measurement in Higher Education," p. 77.

[4] S. S. Colvin, "Psychological Tests at Brown University," SCHOOL AND SOCIETY, 10: 27–30.

[5] Ben Wood, *op. cit.*, p. 47.

[6] K. M. Cowdery, *op. cit.*, p. 2.

greater. The results are as shown in Table III.

TABLE III

CORRELATION BETWEEN TWO FORMS OF THE THORNDIKE EXAMINATION AFTER ONE, TWO AND THREE YEARS

Class	Bravais-Pearson correlation coefficient	P.E.	Interval in years	S.D.
1924–28	.74	± .04	3	10.7
1925–29	.71	± .105	2	10.3
1926–30	.63	± .055	1	7.9

Since the purpose of the study was to determine whether growth continues at the college level, as revealed by improvement of intelligence scores between the time of admission and some later date, it is necessary to consider the possibility of practice effect from the test itself. It is possible that experience with the test on a former occasion might itself produce increase of score on retesting. Cowdery's reexamination of a small group within a year of the first testing showed that the practice effect of the test itself is negligible for the intervals under study. For nineteen Stanford University students who were retested within a year the average increase in score was less than a single point. Can we then neglect the practice effect from the test itself? One feature of the test which especially commends it for our purpose is its insusceptibility to practice effect. This is due to the fore exercise given before the test itself, which eliminates the excessive variation in time taken to read the directions for tests, as well as unreliability due to hurried reading and misunderstanding of directions. Another reason for the slight effect of practice is the character of the test. Only an enormous amount of it would lead to an appreciable increase in score on a new form.

The conditions of administration for first and second examinations were almost identical. The one condition that differed in the two situations was that the test was compulsory on the first occasion and voluntary on the second. This appeared to have slight influence. The degree of effort shown on the two applications was closely similar. The problem—does intelligence improve at the college level?—had been presented by the author to the students, and their cooperation seemed as effective on the second as on the first occasion.

The results of the two applications are presented first in terms of the gross gains for the score on the whole examination. The 1924–28 class after an interval of three years showed a gain of 5.36 points. The 1925–29 class, after an interval of two years, gained 4 points. The 1926–30 class gained 2.6 points after an interval of one year. The scores increase, therefore, with the duration of the interval. They increase, however, in an irregular way. The significance of this increase was determined by using McCall's formula, the experimental coefficient, namely:

$$\frac{\text{Difference}}{2.78 \text{ S.D. (difference)}}.$$

For the 1924–28 class the experimental coefficient is 1.03, which means that there are four hundred chances to one that the average gain of 5.36 is a significant increase. The experimental coefficient for the 1925–29 class is .63. Therefore, the chances are twenty-six to one that their average gain of four points is significant. The experimental coefficient for the 1926–30 class is 4.5, consequently, the chances are nine to one that their average gain, after an interval of one year, of 2.6 points is a significant improvement. These gains from year to year, namely, 2.6, 3.86, 5.36 for one, two and three years, respectively, substantiate the theory that growth continues at the college level. It is small in amount. No conclusion can be derived concerning the curve of growth, since these are not successive scores of one group mea-

sured year after year, but retest scores of three different groups of college women. The increase found, nevertheless, can not be explained away by the smallness of the population studied, nor can they be accounted for by chance errors due to the inaccuracy of the measuring instrument. In order to understand this increase in score, further analysis has been made of the data from the 1924–28 class. How far do the results from this class support the view that after eighteen mental growth is still going on? The relation between the various age levels within this class and size of scores and the relation between the age levels and gain in score on reexamination were investigated. The facts are presented in Table IV.

TABLE IV

AVERAGE INTELLIGENCE SCORES AND AVERAGE GROSS GAIN IN INTELLIGENCE SCORES BY AGE GROUPS (1924–28 CLASS)

Age at entrance	Number of students	Per cent. of students	Average score	Average gross gain
Under 16	1	1.8	108	−1
16–17	4	7.2	87	9
17–18	17	30.4	90	5
18–19	27	48.1	87.4	3.7
19–20	7	12.5	83	11
Average 18 yrs. 6 mos.				
Total	56			

It is apparent that there is no regular tendency for scores to decrease or increase with the age of the group. The numbers are so few we should scarcely expect such a tendency to reveal itself. It is evident that for these students there is no regular increase of scores with age. The oldest group of all, the average age of which was nineteen years and three months at entrance, began with a score five points below the average of the class. It gained on an average eleven points in three years, which was twice the average gain of the class. It might be asked if it is not easier to improve a low score than a high score. In general we know this to be true. The age group 18–19 years, however, and the age group 17–18 years showed average gross gains of 3.7 and 5 points respectively, and their initial scores were up to the average for the Bryn Mawr College group at admission.

An analytical study of the specific capacities measured by the test reveals the differential character of the improvement that occurred for these students. The improvement of scores on specific tests is shown in Table V, which gives the average gain in score for the various types of tests applied.

TABLE V

IMPROVEMENT OF SCORE ON SPECIFIC TESTS

Ability measured	Average gross gain
Linguistic ability	− .6
Language completion	+14
Reading ability	+16
Mathematical ability	+ 5.36
Information	− 2.3
Mechanical aptitude	− 6.7
Visual perception	+ 1.2

The difference in score on test and retest for linguistic ability has no significance. Language completion, on the other hand, gained 14 points, a significant difference. The tests of reading ability show the largest average gain of all. On mathematics tests the improvement is not large, 5.36 points. Analysis showed that students majoring in mathematics had increase of scores on an average of 5.4 points; students having no mathematical instruction in college lost on an average 5.4 points. Other students taking some mathematics, but not majoring in the subject, gained 1.8 points. Scores on the information test, which includes questions in history, physiology, biology, botany, geometry and physics,

dropped 2.3 points, an insignificant difference.

A comparison of the ten best and ten poorest students in these tests of specific capacities was made to see whether good or poor students gained most. Since the tests of perception and reasoning did not discriminate between good and poor students at this level, these were not included in the analysis. The following facts are noteworthy. In the tests of reading ability, in which, in general, the greatest improvement occurred, those who were in the upper half of their class on the first test remained in that half on the second test, and, correspondingly, those below in the first test were still in the lower half three years later; but the ten students who improved most on the reading tests had average reading scores 9½ points below the class average in the first examination. All students showed growth in the ability to grasp and deal effectively with reading material. As so much of academic work is concerned with getting thought from the printed page, this is what we might expect.

The lack of any evidence of growth in the linguistic tests, which gauge knowledge of the vernacular as revealed by the ability to give logical opposites and logical analogies, and to correct disarranged sentences, is probably explained by the fact that the tests need to be lengthened by the addition of more difficult elements to measure Bryn Mawr students adequately. For the same reason the number of elements in the information test should be increased. These are abilities that we would expect to develop greatly as a result of a college education. There is no adequate evidence from this study that this does not occur.

In mathematics, while the improvement is not large, the fact that mathematics majors improved more than other students suggests that training along the lines of the specific abilities measured is the important element in effecting improvement at this as at other levels. As common sense would indicate, all psychological tests can measure is a function of innate capacity and external influences, and where the conditions provide opportunity for exercise of the specific abilities included in intelligence tests, improvement does take place. Maturation is stimulated by such conditions. Thus the power to handle the kind of tasks presented by the Thorndike examination is greater in the senior year than in the freshman, sophomore and junior years, because the abilities involved have had a chance to operate in academic work.

Summarizing, we have evidence that there is for college women significant improvement in general intelligence, as measured by this examination, after the age of eighteen. The gain in intellectual power in the college years, though slight, is significant. The college women continued to improve in their capacity to handle a wide diversity of intellectual tasks up to the senior year. Analysis of the change in specific capacities showed the gain to be most marked in reading ability, probably because of all the capacities developed by college education this is the one most constantly exercised by college studies.

What significance have these facts for the general theory of college education? While far-reaching conclusions are not possible, at least the present tendency to make the work of the senior college a distinct advance upon that of the junior has some justification. Richardson's[7] plea that there should be fewer courses in the last two years with more concentrated work in each is suggested not only by European and American practice, but also is consistent with the greater mental maturity of juniors and seniors.

The evidence submitted by Thorndike of improvement in intelligence scores beyond

[7] Leon B. Richardson, "A Study of the Liberal College," p. 280.

fourteen years of age is here supplemented for this group of superior women beyond the ages of eighteen and nineteen. Ability improves in those subject to intellectual education beyond eighteen. In the studies of growth now in progress it is to be hoped that for those who receive a college education the development of mental capacity will be remeasured beyond the eighteen-year level. There is a difficulty in this connection not generally mentioned, namely, the paucity of tests fitted to measure intelligence for the gifted at this age. Thorndike's examination commands our respect for the fertility of tasks it sets, but there is a challenge to psychologists to contrive new measures of the higher mental processes that will reveal the variety of talents that function in gifted persons over eighteen. It will take much time and effort to construct an absolute scale capable of differentiating the finer degrees of growth at the highest stage of mental maturity. The value of such an instrument would be demonstrated wherever it was necessary to select students of exceptional capacity for honors courses, when for some special reason the decision was uncertain. Experience is so complicated and confused by a multiplicity of varying factors in individual cases that such a test would be a contribution in the field of higher education.

HE WHICH HAD RECEIVED THE ONE TALENT[1]

By Dr. WILLIAM JOHN COOPER
UNITED STATES COMMISSIONER OF EDUCATION

AFTER-DINNER speaking is a fine art. In common with other fine arts it suffers from a shortage of first-rate artists. In common with them also it offers an avocational field for many who would not lay claim to professional status. For these amateurs the after luncheon speech is designed.

The manual of directions informs one that on such an occasion *Homo sapiens,* having satisfied his physical hunger, longs not for mental pabulum but rather a period of inactivity while his body is engaged primarily on digestive problems. Therefore, the first function of the speaker is to preserve the guests from boredom or better yet to cause the chuckles or ripples of laughter which are supposed to aid digestion and with less muscular effort than is required by those widely advertised confections having a chicle base. To afford this entertainment or amusement the story was invented. Harvard folks of course know all four of the original stories and all the worth-while variations of these themes. Certainly I know no new ones.

There is, however, one other legitimate use of the story, namely, to illustrate a point. One of the most effective instances of this use of the story I heard related by a member of the supreme bench of one of our states. He said that one of his first cases as a young attorney involved an alleged breach of contract. The situation was this: A contractor has agreed with a hotel man to install a hydraulic elevator in the new hotel. The contract called for two four-thousand gallon tanks on the roof. For reasons not given and not pertinent here, four two-thousand gallon tanks were installed. The owner refused to pay on the ground that the terms of the agreement had not been met. Whereupon the contractor sued and our young attorney entered the case as counsel for the defense. He marshaled his engineering data with great skill and presented them cleverly, but in studying the faces of the jurymen he

[1] An address delivered before the Harvard Teachers' Association.

became painfully aware that the opposing counsel was winning their support by insisting on the arithmetical fact that 4×2 equals 2×4. In desperation he decided to try a story and this is what he told that jury: In the days of the old sailing ships there was a certain sea captain who was compelled to be out of sight of land on the broad Pacific for weeks at a time. Frequently he had men seriously ill, but could not afford a doctor. He conceived the idea of having a physician outfit a medicine chest for the cabin and write out for him a simple description of the symptoms of common ailments and directions for treating them. On a subsequent voyage a member of the crew was discovered doubled up on the deck, evidently in great pain. The symptoms, when matched up with the diagnosis book, indicated colic, and the treatment prescribed was two teaspoonfuls of bottle No. 4. But when the captain opened the medicine chest he found No. 4 entirely empty. Whereupon he concluded to try a substitute. He gave the sailor four teaspoonfuls of bottle No. 2 and the man died. It was evident to that jury that 2×4 and 4×2 were not always the same thing and their verdict was in favor of the hotel man.

We all recognize in Abraham Lincoln a great master in this use of the story. But I want to use as a text for what I shall say to-day a very old and simple story—one, we are told, that was used by Jesus of Nazareth, master of the art of presenting profound truth in simple form. As related by the Apostle Matthew the story runs that a certain man "called his own servants, and delivered unto them his goods. And unto one he gave five talents, to another two, and to another one; to every man according to his several ability; and straightway took his journey. Then he that had received the five talents went and traded with the same, and made them other five talents. And likewise he that had received two, he also gained other two."[2]

When the master returned a day of reckoning was had. He that had received five talents reported earning another five, and he that had received two talents reported earning another two. Both were appropriately rewarded. He that had received but one talent, however, brought back only the original capital. He was reprimanded and punished.

This story furnishes the concrete setting for what I care to say to you on the general topic "Intelligence—Its Nature and Its Measurement." The first of these comments is that we do not know why one student has been given five talents, another two and yet another one. We have gone far enough, however, to know that there are these great differences in ability. Although the knowledge of why these differences exist may be of assistance to society in making progress, it is not of great concern to the practical school administrator since he can neither change the effect which nature has made as its contribution nor greatly modify the environment in which a child develops. Realizing, however, that these differences can exist, one is confronted with the problem of serious efforts to ascertain just how many talents each student has, and having learned this to so organize his educational scheme that each pupil will be expected to make return in terms of his endowment. In accomplishing this our educational psychologists have made commendable progress.

The second comment which I care to make is this: Let us ask for a return from every one and not neglect the one-talent man in favor of the two-talent man and the five-talent man. At the Boston meeting of the Department of Superintendence a great controversy arose over an address by President Lowell, of Harvard Univer-

[2] Matthew 25: 14–17.

sity. It has always seemed to me that that discussion originated in large measure because President Lowell and his critics probably were not talking about the same thing. Certainly they were not talking the same language. It is entirely within the right of Harvard University to restrict its facilities to the five-talent man if it so desires. Harvard's first obligation is to live within the terms of the trusts which it administers for educational purposes. If the donors of these educational facilities have intended them for the benefit of the student with five-talent endowment they should be so used, and Harvard University is entirely justified in refusing to offer its facilities to those of lesser abilities. On the other hand, Harvard educators should exercise care that they neither discredit nor discourage the efforts of those who minister to all the children of all the people since of him who had been given but one talent a return was also expected. The public schools must care for all the children. Those who minister these schools expect from them who minister only to the college education of the highly endowed sympathetic consideration and such assistance as Harvard people can consistently give in addition to their work for those who are accepted by Harvard.

The third comment I make is this: This study of intelligence leads us to consider the importance of biology and sociology in our preparation of teachers. We are likely to make more progress in solving the problems of education when we give up regarding it as a subject merely and look upon it rather as a field of professional practice. I have been much interested in the movement for the establishment of degrees in education which was sponsored by Harvard University. Although I can not say that I fully subscribe to requirements for the degree of doctor of education which are virtually the same, except for subject matter, as the requirements for the degree of doctor of philosophy, I do believe that there is as much justification for the degree doctor of education, as there is for the degree of doctor of medicine or doctor of dental surgery.

As long as we regard education as a subject, there is bound to be a tendency to pad courses and to unnecessarily duplicate work since each instructor is attempting to cover in his course too much territory and accordingly is likely to do it in too superficial a manner. Whenever we look upon teaching as a profession to be practised, a calling which requires the exercise of judgment and skill in bringing to bear upon the problems of the individual, whether he be of one talent, or of two talents, or of five talents, the scientific data gathered under the name biology, psychology, sociology, techniques of teaching, and the like, we are doing a work similar to that done by the physician when he brings to bear upon the maladjustments of the individual patient the resources of anatomy, physiology, materia-medica, surgery or whatnot.

I commend thoroughly this interest of graduates of Harvard in the general problems of education and the splendid leadership furnished by Dean Holmes and his staff in your work. I thank you for the privilege of being present and having some simple part in this program devoted to a problem of such far-reaching importance.

EDUCATIONAL EVENTS

THE SCHOOLS OF WALES

STATISTICS published by the British Board of Education, and summarized in the *Times Educational Supplement*, show that in the primary schools there has been a steady decline in the number of pupils in attendance. The decrease

for last year in the average number of pupils on the register was 5,482. Thirty-nine per cent. of this occurs in the urban areas, 29 per cent. in the urban portions of the counties and 18 per cent. in the rural areas. Part of this decline is attributed to migration of the unemployed workers, but the chief cause is the decline in the birth rate which has been going on since 1920. Indeed, the decline since that year in the number of births has been over 33 per cent., a new and not unimportant factor. The size of the classes continues steadily to decrease, and when the schemes for reorganization have been made effective large classes should disappear. Last year there were 417 classes containing 50 or more pupils, and 16 classes with over 60 pupils. The number of teachers per thousand pupils in average attendance was 38.5; and in England it is 33.7. But these figures are due in part to the comparatively large rural areas in Wales, with their small school population. Of the Welsh teachers 24.1 per thousand pupils are certificated, 11.5 uncertificated and 2.1 are supplementary. In this regard Wales compares unfavorably with England, where the figures are 25.2 for certificated teachers, 6.1 for uncertificated teachers and 1.5 for supplementaries. The secondary schools show a steady increase in the number of their pupils in attendance. In 1928 there were 36,804 pupils (19,277 boys and 17,527 girls); in 1929 the number of pupils was 38,367 (20,145 boys and 18,222 girls), representing 14.3 pupils per 1,000 of the population. There were last year 145 recognized secondary schools in the principality. The percentage of free places is high—54.8 per cent. In 22 schools no fees were charged. The age of entry into the secondary schools continues slowly to fall, though 12+ years is still the more usual age of entry. The average school life after the age of 11 years is 4 years 1 month for boys and 4 years 2 months for girls, and the average age of pupils leaving after the age of 14 years is 16½ years. Thirty-two schools take advanced courses, the most popular of which is that for science and mathematics. On the other hand, 117 of the schools entered 618 pupils for the second examination. Of the pupils leaving 543, or some 8.8 per cent., left to continue their studies at a university, and of these 87.3 per cent. were ex-elementary school pupils. In England the corresponding figure is 64.7 per cent. The average number of pupils to each assistant teacher was 21. The average gross expenditure per secondary school pupil for 1927–28 was £23 9s. 6d., the most expensive county being Montgomeryshire at £27 7s. and the cheapest Carmarthenshire at £19 14s. per child.

FEDERAL APPROPRIATIONS TO SCHOOLS FOR INDIAN CHILDREN

A SPECIAL correspondent of *The Christian Science Monitor* writes that the long struggle to obtain an adequate food and clothing allowance for Indian children in federal board schools has finally ended in victory for the Indians. The House and Senate have voted $665,000 which is the full amount of added appropriation needed to establish President Hoover's minimum food and clothing standard, beginning next July. The Hoover standard calls for 37.8 cents per day per child for food, and $42.26 a year for clothing for each child. The government food allowance for the Army and Navy is approximately 50 cents a day per man, but even though the minimum standard for Indian children is less than this, the new figure represents a large increase over all previous standards. Indian Bureau officials charged last January that extreme undernourishment prevailed at the schools, and that children were being clothed "below the minimum standard of health, comfort and decency." Some 21,000 Indian children are affected by the change.

Last December President Hoover sent a message to Congress asking an emergency appropriation to bring the Indian children's standards up to the "minimum" level declared necessary by a group of experts who had surveyed the whole field. Following opposition by Louis C. Cramton, Republican from Michigan, chairman of the House Subcommittee on Interior Department Appropriations, the appropriation was greatly reduced. The Senate Indian Investigating Committee thereupon held hearings, and protests from all over the country rolled into Washington. The deficiency appropriation bill passed at that time gave a start to the increase asked for the Indian schools, and the

contest moved on to the appropriation bill for the fiscal year beginning July 1.

In April, the Federal Indian Bureau requested the Senate Appropriations Committee to grant the entire sum required to meet the Hoover food standard, and this move has culminated in victory for the Indian children, in action just taken by the House and Senate.

The National Council of American Indians and the American Indian Defense Association were active in bringing up the level of the Indian children's food and clothing allowance. These groups occupy a unique position outside of the government, but are intimately concerned with promoting the welfare of the government's wards.

THE FINANCIAL NEEDS OF THE CHICAGO SCHOOLS

AT the request of the Chicago Board of Education Superintendent Wm. J. Bogan has prepared a statement in which he points out that there are 1,018,889 pupils in the New York City schools, and 464,822 pupils in the Chicago schools. Therefore, school expenditures in the two cities should be approximately in the ratio of 100 to 46. However, the ratio of instruction costs in New York to those of Chicago for 1928 (the latest data available for both cities) was 100 to 34, instead of 100 to 46. Instruction costs consist primarily of teachers' and principals' salaries. New York spent $106,026,889 on instruction; 46 per cent. of that amount is $48,348,262; but Chicago actually spent only $36,733,120 on instruction. Simply to equal the New York rate of expenditures for instruction, Chicago should have spent $11,615,141 more than it actually did spend.

Superintendent Bogan says that, when adopted in 1922, several of the present schedules did not restore the 1914 pre-war purchasing power, and during all these years the teachers and principals in these groups have not had their pay properly adjusted. In 1926 the Board of Education recognized this fact when it adopted new schedules with maximums approximately 25 per cent. higher than the present maximums. The fact that the action adopting these schedules was reconsidered later did not impair the standards then set up, because the reason for the reconsideration was unquestionably merely a financial one, namely, insufficient funds to put them into effect.

Several progressive cities have salary schedule maximums higher than those in Chicago. In the following cities, for example, the elementary teacher maximums exceed Chicago maximums: New York, Cincinnati, Cleveland, Minneapolis, Louisville, Yonkers, Boston, Bridgeport, Denver, Paterson, Jersey City, Canton, Washington, D. C., Newark, Des Moines, Indianapolis and Pittsburgh.

At the present time there is an accumulated gross shortage of 54,638 seats; that is, one out of every nine children in the Chicago public school system is without an adequate seat. The pupil membership is increasing at the rate of 7,679 pupils per year. According to the auditor, about $10,000,000 of the building fund revenues have heretofore been allotted annually to new buildings. It will require an estimated $8,137,500 of new construction per year simply to keep up with the normal growth of school membership. In fact, construction of senior high-school buildings has not kept pace with the increase of pupils. In September, 1924, there was a seat shortage of 13,230 in senior high schools; on February 3, 1930, there was a shortage of 29,150 in senior high-school seats. Twenty of Chicago's twenty-four senior high schools are overcrowded, with an average excess of 55 per cent. over their normal capacity. In addition to this, many of Chicago's school buildings are old and inadequate from the standpoints of sanitation, fire hazards and adaptability to a modern curriculum. There are thirty-four buildings in need of modernization.

THE BUDGET OF NEW YORK UNIVERSITY

SALARY increases for the faculty of New York University and the addition of new instructors have been provided for in a budget of $7,531,264 for the fiscal year beginning on July 1, according to an announcement made by Chancellor Elmer Ellsworth Brown. This is an increase of $957,424 over the budget for the current year.

Mr. LeRoy E. Kimball, controller of the university, stated that the budget for the schools and divisions under the direct management of the corporation had doubled every fifth or sixth

year. He added that the budget for the new year would be almost eighteen times as great as in 1911, Dr. Brown's first year as chancellor.

"In 1911," Mr. Kimball said, "the total budget was $420,000; in 1916, $824,000; in 1920, $1,780,000; in 1925, $3,057,000, and for the new year starting July 1, 1930, more than $7,525,000. This regular increase has brought with it all the financial growing pains which might be expected under the circumstances."

The total for faculty salaries in the new budget will amount to $4,024,805, against $3,587,788 for the current year, and is the largest single item. For current laboratory replacements, supplies and expenses, about $500,000 has been allotted, while the appropriation for the binding and purchase of books for the library is $75,000. Charges for plant maintenance are set at $906,027, of which $524,168 goes to the Washington Square center of the university.

The largest budget for a single school is that of Washington Square College, the coeducational college of liberal arts, where expenses of $1,809,099 have been authorized. The School of Commerce, Accounts and Finance is second, with $1,021,183.

The allowance for University Heights, where the University College of Arts and Pure Science and the College of Engineering are located, is $771,436. Other budgets are: School of Education, $898,753; University and Bellevue Hospital Medical College, $499,994; College of Dentistry, $414,846; School of Law, $258,216; Graduate School, $251,877, and the Summer School, $189,510.

APPROPRIATIONS FOR STATE COLLEGES AT CORNELL UNIVERSITY

THE New York State Legislature, recently adjourned, made appropriations for a number of important expansions or new activities for the State Colleges and Experiment Stations at Cornell University. Among the more significant of these was an appropriation of $510,000 to be used with an appropriation of $485,000 made by the legislature of the preceding year for the erection of a new building for the work in home economics; authorization to enter contracts for a new building for agricultural economics and rural social organizations at a cost of $650,000; and an appropriation of $285,000 for a new horticultural research laboratory at the State Experiment Station at Geneva. A grant of $400,000 was made for the equipment of the new million dollar plant science building now nearing completion. In addition to these major items the regular budget of the College of Agriculture was increased by $82,020 and there were incorporated as permanent funds $51,050 of special grants made for animal husbandry developments the year preceding. The following special items were also appropriated:

Construction of barns and facilities for animal husbandry, $100,000; purchase of additional land for animal husbandry purposes, $60,000; office and laboratory building at Long Island Vegetable Research Farm, $13,000; addition to tool shed for Long Island Vegetable Research Farm, $1,000; grading, walks, roads, etc., for plant science building, $15,000; investigations for control of Oriental peach moth, apple maggot, etc., by State Experiment Station at Geneva, $37,000; for the survey of agricultural resources of the state, $20,000; for investigation in the spraying and dusting of potatoes on Long Island, $16,500; for extension work in potato growing, $5,500; for investigation in grading and handling of vegetable crops, $5,800; for investigation in control of insects affecting muck soil crops, $6,010; for investigation in control of insects affecting potatoes, $4,000; for an experiment to determine the optimum percentage of protein in a dairy ration, $5,900; for equipment and maintenance of The Western New York Egg Laying Contest, $30,000; for equipment and maintenance of the Central New York Egg Laying Contest, $30,000; for additional state support of County Farm and Home Bureaus and Junior Extension Work, $40,500.

Another legislative enactment of outstanding importance to the State Colleges at Cornell University was a bill admitting all of the staff and employees of these institutions to the privileges of the State Retirement System. Because of the generous character of this system, this provision is considered a distinct benefit by members of the staff.

EDUCATIONAL POSITIONS UNDER THE FEDERAL GOVERNMENT

THE United States Civil Service Commission states that the position of director of educa-

tion, Indian Service, Department of the Interior, Washington, D. C., is vacant, and that the following method of competition will be used to fill the vacancy.

Instead of the usual form of civil service examination, the qualifications of candidates will be passed upon by a special board of examiners, composed of Dr. Charles R. Mann, chairman of the National Advisory Committee on Education; Dr. Henry Suzzallo, of the Carnegie Foundation for the Advancement of Teaching and the National Advisory Committee on Education, and Dr. H. A. Edson, chief examiner of the Civil Service Commission, who will act as chairman of the committee. For the purpose of this examination they will be examiners of the Civil Service Commission.

The director of education, under the Commissioner of Indian Affairs, will have the direct supervision and responsibility for initiating, outlining, developing and directing the educational work of the Indian Service. He will be required to formulate, revise and develop curricula adapted to the special needs of education, and designed to prepare Indians ultimately to take their places as productive and contented citizens; to conduct educational conferences, and to have contact with state and local public-school officials, and with other bureaus and officers of the government. The duties are said to require a high degree of administrative ability, capacity and vision.

The entrance salary is $5,600 a year. Promotion may be made without change in assignment up to $6,400.

Applications for guidance and placement officer, and associate and assistant guidance and placement officer must be on file not later than June 18.

The entrance salaries range from $3,800 to $4,400 a year for guidance and placement officer, $3,200 to $3,700 a year for the associate grade and $2,600 to $3,100 a year for the assistant grade. Higher-salaried positions are filled through promotion.

The duties are to search the occupational field for opportunities for Indians, to make contacts with employees and to cultivate with them a cordial attitude toward Indian workers, to find job openings, to place applicants, to follow up such placements and to keep records and make reports on all such activities. Contact must also be made with educational, social and civic agencies which will serve the need of the workers.

Competitors will not be required to report for examination at any place, but will be rated on their education, experience and fitness.

THE LOS ANGELES MEETING OF THE AMERICAN LIBRARY ASSOCIATION

"THE Library Movement in California" will be the subject of a full session at the fifty-second annual conference of the American Library Association, to be held at the Biltmore Hotel, Los Angeles, from June 23 to 28. Dr. Andrew Keogh, librarian of Yale University and president of the American Library Association, will preside.

Milton J. Ferguson, librarian of the California State Library, will speak on the county library system of California; Miss Althea Warren, first assistant librarian of the Los Angeles Public Library, will discuss the state's public libraries; Nathan van Patten, director of Stanford University Library, will speak on college libraries; Miss Ella S. Morgan, librarian of Lincoln High School Library, Los Angeles, on school libraries, and Dr. Max Farrand, director of research at the Huntington Library, will describe that library.

Orra E. Monnette, president of the board of library commissioners of the Los Angeles Public Library, will give the address of welcome at the first general session, followed by a presidential address from Mr. Keogh. There will be a reception later in the evening.

Dr. Robert G. Sproul, who will be president of the University of California after July 1, will address the third general session of the conference, followed by Levering Tyson, field representative of the American Association for Adult Education, who will speak on two new aspects of adult education—alumni and radio education.

The Newbery medal for the most distinguished children's book of the year, written by an American, will be awarded to the author in person at the fourth and last general session by Effie L. Power, of the Cleveland Public Library, chairman of the section for library work with children of the American Library Association.

Following a brief response from the author Ralph Munn, director of the Carnegie Library of Pittsburgh, will speak on "Library Work with Children."

Forty sections and committees will hold round table meetings to discuss rural adult education, the public library in the field of business, reading for pleasure among college students, hospital library service, the junior college library, library architecture, western books and book buying, library publicity, school library work, and related problems.

Mabel R. Gillis, assistant librarian of the California State Library, will speak before the League of Library Commissions and the National Association of State Libraries on "Special Features of the Work of the California State Library," and at the same meeting, Mr. Ferguson will report on a demonstration of library service financed in Louisiana by the Carnegie Corporation upon recommendation of the League. The demonstration was planned to show what a newly established state library agency can do if the work is adequately financed.

"The Mexican Immigration Problem" will be the subject of a talk by Dr. Emory Stephen Bogardus, director of social welfare at the University of California at Los Angeles, before the committee on work with the foreign born. Dr. Bogardus's address will be followed by a discussion of Americanization work by Ettie Lee, assistant supervisor of Americanization in the Los Angeles city schools.

The Detroit charging system, which allows a library borrower to charge his own books, will be demonstrated among the library exhibits and discussed at the small libraries round table. At the same meeting, Mrs. Zulema Kostomlatsky Rowell, of Orange, California, will give her opinion on "What the Public should Expect from the Library."

The Association of American Library Schools and the Bibliographical Society of America will meet with the American Library Association. About 2,000 of the 15,000 members of the American Library Association are expected at the conference.

THE COLUMBUS MEETING

The tentative program for the meeting of the National Education Association to be held at Columbus, Ohio, from June 28 to July 4, has been arranged. "Vital Values in Education" is the subject about which the papers and discussions will center.

There will be a local concert on Saturday evening. Vespers will be held on Sunday at 4 p.m., presided over by Dr. J. G. Collicott, superintendent of the city schools. The address will be by Dr. W. O. Thompson, president emeritus of the Ohio State University. At the evening session, presided over by Dr. J. L. Clifton, commissioner of education, Ohio, the subject is "Character and Religious Education" under the headings: What the Schools can do: (speaker to be announced); What the Home can do: Mrs. S. M. N. Marrs, president of the National Council of Parent Teachers, Austin, Texas; What the Church can do: Bishop William F. McDowell, Methodist Episcopal Church, Washington, D. C.

On Monday morning the general session will be presided over by Dr. Uel W. Lamkin, president of the Northwestern State Teachers College, Maryville, Missouri. After music and addresses of welcome, the principal address will be made by Dr. Paul Dengler, director of the Austro-American Institute of Education, Vienna, on "Educational Progress in Europe." This will be followed by a second address, for which the speaker will be announced later. A reception by the governor of the state will be held at four o'clock in the afternoon, after which the life membership dinner is scheduled. At 8:30 a pageant will be given.

On Tuesday, Wednesday and Thursday, the Representative Assembly, presided over by E. Ruth Pyrtle, the president of the association, will open each day at 9 a.m. The general sessions on Tuesday emphasize "The International Point of View." Two of these sessions open at 9 a.m., one presided over by Cornelia Adair, teacher in Bainbridge Junior High School, Richmond, Virginia, at which addresses will be made by Bess Goodykoontz, assistant U. S. Commissioner of Education; Ida Odelle Rudy, Dayton, Ohio, and A. O. Thomas, president of the World Federation of Education Associations; the second, presided over by Fred M. Hunter, chancellor of the University of Denver, with addresses by Clare Soper, secre-

tary of the New Education Fellowship, London, England, and Camilo Osias, resident commissioner, Philippine Islands.

At the general session in the evening Olive M. Jones, of New York City, will be the presiding officer. Three addresses will be made on the following subjects: Progress in Europe; Progress with Teachers: Judge Florence Allen, Ohio Supreme Court; The Educational Outlook: E. Ruth Pyrtle.

On Wednesday, July 2, the general sessions will again be divided into three divisions, the subject of the first session being "The Art of Living," and the presiding officer, Joseph Rosier, president of the State Teachers College at Fairmont, West Virginia. Addresses will be made by Mary McSkimmon, principal of the Pierce School, Brookline, Massachusetts; Howard R. Driggs, Teachers College, Columbia University, and Elizabeth Hall, assistant superintendent of schools at Minneapolis, Minnesota. At the second simultaneous session on "The Enrichment of Adult Life," addresses will be made by Thomas W. Gosling, superintendent of schools at Akron, and W. J. Bogan, superintendent of schools at Chicago. In the evening a second session on "The Art of Living" will be presided over by M. C. Lefler, superintendent of schools at Lincoln, Nebraska, with addresses by Sol Bloom, congressman from New York, Ruth Bryan Owen, congresswoman from Florida, and Willis A. Sutton, superintendent of schools, Atlanta, Georgia.

On Thursday the three general sessions will be given over to the subject "Creative Learning." George M. Davison, principal, Brooklyn, New York, will preside over one of the morning sessions and Florence Hale, state director of rural education, Augusta, Maine, and Dean W. E. Sealock, University of Nebraska, will make addresses. At the second morning session, presided over by Dr. Randall J. Condon, Friendship, Maine, an address will be given on "Use of Radios in the Development of an International Point of View" by Richard Stanton Lambert, editor, *The Listener*, London, England, and Judge Ira E. Robinson, chairman, Federal Radio Commission, will also speak. At the evening session the speakers will include Dr. F. J. Kelly, president of the University of Idaho, and William John Cooper, United States Commissioner of Education.

A session on Friday, July 4, will be devoted to "Patriotism," E. Ruth Pyrtle presiding.

EDUCATIONAL NOTES AND NEWS

DR. KARL TAYLOR COMPTON will be installed as president of the Massachusetts Institute of Technology on June 6. Dr. Compton, now professor of physics at Princeton University, succeeds Dr. Samuel W. Stratton, who becomes chairman of a newly created executive committee of the corporation of the institute.

DR. WILLIAM CULLEN DENNIS, formerly international lawyer and counselor for the American Government in several arbitration cases, was inaugurated on May 14 as sixth president of Earlham College, Richmond, Indiana. He was inducted into office by Dr. Walter C. Woodward, editor of the *American Friend* and chairman of the college trustees. Professor Rufus Jones, of the department of philosophy of Haverford College, and Dr. R. L. Kelly, formerly president of Earlham College and now permanent secretary of the Association of American Colleges, received the honorary degree of doctor of laws.

DR. C. H. COOPER, president of Mankato Teachers College for thirty-one years, has resigned, his resignation to take effect on July 1, when he will become president emeritus. Dr. Cooper was professor of history and government at Carleton College for sixteen years before going to Mankato. The committee named to select his successor includes J. M. McConnell, state commissioner of education; I. N. Tompkins, resident director of the Mankato institution, and S. H. Somsen, resident director of the Winona State Teachers College.

DR. DAVID ROSS BOYD, who was the first president of the University of Oklahoma from 1892 to 1908, has been made president emeritus. Dr. Boyd was later for seven years president of the University of New Mexico.

PROFESSOR HARRY L. AGARD has been appointed dean of Williams College, succeeding George E. Howes, who was appointed dean in

1920 and resigned in February, previous to a sabbatical leave of absence.

DR. F. L. PICKETT, professor in, and for twelve years head of, the department of botany at the State College of Washington, Pullman, has been appointed dean of the graduate school.

DR. FOWLER D. BROOKS, associate professor of education at the Johns Hopkins University, has been appointed head of the departments of education and psychology at DePauw University, Greencastle, Indiana.

AT Yale University Samuel B. Hemingway, associate professor of English, has been appointed chairman of the department of English, and Percey F. Smith, professor of mathematics, chairman of the department of mathematics. Norman S. Buck, associate professor of political economy, has been promoted to a professorship. Albert Beebe White, professor of history at the University of Michigan, has been appointed visiting professor of history, and Duane Reed Stuart, professor of classics at Princeton University, visiting professor of Latin for the second term of the next academic year.

LIEUTENANT-COLONEL FIELDING H. GARRISON, who has been in the United States Army Medical Service since 1891, has taken up his work as head librarian of the William H. Welch Medical Library.

ACCORDING to press reports, Dr. Arthur S. Libby, dean of the School of Banking and Commerce at Oglethorpe University, and Mrs. Libby, professor of economics, have been dismissed by the board of trustees, and the action is being protested by the alumni.

SUPERINTENDENT H. S. WEET, who was granted a leave of absence with salary on August 1 last by the Board of Education of Rochester, New York, returned on May 1 to resume his work fully restored to health. A dinner in his honor was given by the Rochester Teachers Association, at which 1,746 covers were laid. After the dinner there was music and a play. Presentation was made to Mr. Weet of a motor boat. Mr. Joseph P. O'Hern, deputy superintendent of schools, was presented with life membership in the National Education Association.

A TESTIMONIAL dinner will be given in the Hotel Astor on June 9 in honor of the election of Mr. William J. Weber as vice-president of the New York City Board of Education.

ASSOCIATE SUPERINTENDENT GUSTAVE STRAUBENMULLER, of New York City, will retire in February of next year when he will have reached the age limit of seventy years.

C. R. HOLBROOK, superintendent of San Bernardino, California, for four years, has been appointed superintendent of the public schools of Santa Cruz.

WE learn from the *Journal of Education* that L. E. Chenoweth, superintendent of schools at Bakersfield, California, has declined the presidency of the Humboldt State Teachers College at Arcata, California, to which he had been appointed by State Superintendent Vierling Kersey.

DR. ALEXANDER G. RUTHVEN, president of the University of Michigan, has been elected to the office of honorary national president of Phi Sigma.

DR. GEORGE J. RYAN, who was recently elected president of the New York City Board of Education for the ninth consecutive term, delivered his inaugural address on May 13. He spoke especially of the desirability of making every possible effort to provide for the "problem child" to the end that truancy, delinquency and crime be reduced.

PROFESSOR CHARLES A. BEARD was elected president of the Association of History Teachers of the Middle Atlantic States and Maryland on May 10. He succeeds Professor Carlton J. H. Hayes, of Columbia University. Mildred Coughlin, of the Western High School, Baltimore, was named vice-president and Lena C. Van Bibber, of Maryland State Normal School, Baltimore, secretary and treasurer.

THE Pulitzer Prize of $2,000 for the best book in 1929 upon the history of the United States has been awarded posthumously to Claude H. Van Tyne.

THE vice-chancellor of the University of Oxford, the Reverend F. Homes Dudden, master of Pembroke College, presided at a special meeting of convocation on May 4 in the Shel-

donian Theater for the purpose of conferring the honorary degree of doctor of letters on three members of the International Committee of Historical Sciences: Dr. Bronislaw Dembinski, professor of modern history in the University of Posen and president-elect of the International Historical Congress to be held at Warsaw in 1933; Dr. Alfons Dopsch, professor of history in the University of Vienna, and Dr. Nicolae Jorga, professor in the University of Bucharest.

DR. ROBERT PRESTON BROOKS, dean of the school of commerce of the University of Georgia, has been appointed fellow for 1930–31 of the Albert Kahn Foundation for the Foreign Travel of American Teachers. The fellowship, valued at $5,000, was founded by Albert Kahn, of Paris. Dr. Brooks will study conditions in Russia, China and India.

DR. THOMAS E. BENNER, visiting professor of Teachers College, Columbia University, formerly chancellor of the University of Porto Rico, is serving on the staff organized by the Office of Education to survey higher education in Oregon for the Oregon State Board for Higher Curricula. Dr. Benner was in Washington, D. C., at the Office of Education during April and is to be in Oregon during May. The survey is under the general direction of Dr. Arthur J. Klein, chief of the division of higher education.

DR. WARREN S. THOMPSON, director of the Scripps Foundation for the Study of Population at Miami University, left on May 22 for an extended stay in Russia and the Orient, where he will study population problems.

PROFESSOR DONALD P. COTTRELL, of Teachers College, Columbia University, has been granted a leave of absence for the academic year 1930–31 to travel in Europe, visiting universities and higher schools for the purpose of studying their organization, administration and educational work.

DR. F. M. TISDEL, dean of the College of Arts and Science of the University of Missouri, has been granted leave of absence for the first semester of next year. He will investigate the administration of schools of arts and science in other institutions and continue his work in the study of English literature.

PROFESSOR E. D. MITCHELL, of the University of Michigan, has been appointed secretary-editor of the American Physical Education Association, which, beginning on January 1 last, publishes the *Journal of Health and Physical Education*. The new magazine results from a merger of the *American Physical Education Review* and the *Pentathlon*, journal of the Middle West Society of Physical Education.

PROFESSOR ELLWOOD P. CUBBERLEY, dean of the school of education at Stanford University, who is during the present academic year visiting professor at Teachers College, Columbia University, has been spending much of the month of May in Massachusetts delivering the annual Todd Lecture at each of the ten state normal schools. He was also the principal speaker at the annual meeting of the Junior and Senior High-school Principals at Framingham. The Todd Lecture Fund arose from a grant of money given three quarters of a century ago by a citizen of Massachusetts, the income to be used for the improvement of teacher training in the state. Five years ago the Massachusetts department of education decided to use the fund for an annual lecture to the student body of each normal school.

DR. MELVIN A. BRANNON, chancellor of The Greater University of Montana, was the guest speaker at the final meeting of the year of the Yellowstone Valley Schoolmen's Club, held at Billings on May 10. Dr. Harlan C. Hines, organizer and first president of the club, is succeeded as president for the coming year by Mr. Fred Graff, superintendent of public schools at Laurel, Montana. Professor Leon R. Foote and Mr. Harry Stuber, both of the faculty of the Eastern State Normal School, were elected vice-president and secretary, respectively.

DR. HARRY ALLEN OVERSTREET, professor of philosophy and head of the department of philosophy at the College of the City of New York, will join the faculty of the University of California summer session from June 30 to August 9. This will be his fourth summer at the University of California. Professor Overstreet will give one course in the department of educa-

tion on public opinion and adult education and will serve as director of the special school of adult education which will be held as a part of the session.

DR. JOHN M. BERDAN, professor of English literature at Yale University, will give two courses in the University of California Summer Session in the department of English. One will be on the age of Pope from the Restoration to his death, the following authors to be read: Dryden, Defoe, Prior, Addison and Steel in the *Spectator*, Gay, Swift and Pope. The second course will be for graduate students on Spenser, a study of Spenser against the background of his age.

DR. WILLIAM C. BOWER, professor of religious education at the University of Chicago and a former dean of Transylvania College and the College of the Bible, will deliver the baccalaureate address at the University of Kentucky on June 1. The commencement speaker is Dr. Henry Goddard Leach, editor of the *Forum*.

DR. GEORGE E. VINCENT, formerly president of the Rockefeller Foundation and of the University of Minnesota, will deliver the commencement address at Lehigh University.

THE president of the Poetry Society, Dr. William Griffin, presented the silver medal of the society to Charles D. Woodberry on May 14 in memory of his uncle, George Edward Woodberry, poet, teacher and writer, who died last January. Brief tributes were paid to Professor Woodberry, who would have been seventy-five years old on May 14, by Dr. J. E. Spingarn, Professor John Erskine and Louis V. Ledoux. The memorial ceremonies were held in the New York Public Library, where a special exhibit of books, manuscripts and pictures of the poet was opened. George Edward Woodberry was professor of comparative literature at Columbia University from 1891 to 1904, a fellow of the American Academy of Arts and Sciences and a member of the American Academy of Arts and Letters.

UNDER the direction of Dr. Walter D. Cocking the first annual School Administrators Training School and Conference held at George Peabody College for Teachers from April 28 to May 2, at Nashville, Tennessee. Eight hundred superintendents, principals, school board members and teachers from twenty-six states and two foreign countries attended. Fifteen specialists form state universities, the U. S. Office of Education, state departments of education, administrative staffs of public schools, the National Education Association and the George Peabody College for Teachers constituted the faculty of the school. Courses conducted in regularly scheduled classes dealt with school-board duties, school-business management, teacher rating, selection of texts, public relations, school buildings and sites, staff organization, selection of teachers, libraries and cafeterias. Thirty-eight commercial exhibits were shown. The administrators and others attending the conference, by resolution approved the plan to repeat the school next year when it is expected that 2,500 will attend.

THE Harvard Board of Overseers has announced the names of five new Harvard house units which are to be ready for occupancy in September, 1931. They are to be named after men outstanding in the history of the university—Eliot, Kirkland, Leverett, Winthrop and Adams. Eliot House is named for Charles W. Eliot, for forty years head of the university. Kirkland House is named after John Thornton Kirkland, president from 1810 to 1828. Leverett House derives its name from John Leverett, president of Harvard College from 1707 to 1724. Winthrop House is named in memory of John Winthrop, first Harvard scientist and acting president during the year 1773-74. Adams House recalls the association of many members of that family with Harvard, notably John Quincy Adams, of the class of 1787, later sixth President of the United States. Adams was Boylston professor of rhetoric and oratory from 1806 to 1809, and a member of the Board of Overseers from 1830 to 1848.

DISCUSSION

WHAT VALUE CURRICULUM MAKING?

WITHOUT intent of appropriating bodily the title of Dr. Whipple's interesting article in SCHOOL AND SOCIETY under date of March 15, 1930, the writer wishes to present the other side of the question and to set forth some of the

real values of the so-called "epidemic" of curriculum making by teachers which has been prevalent during the past ten years. Some of this work is doubtless amateurish; some may be of very little constructive value in the solution of curriculum problems generally throughout the country; but all of it has helped to focus the attention of teachers and school officials on the faults of the past scheme and on the present needs of the pupils and schools.

Let us take Dr. Whipple's example of the situation in Blanko and view it in a less pessimistic manner. The superintendent in this well-known city of some 50,000 population finds a number of the more progressive teachers of the system—witness their summer school attendance and their saturation with the new idea—eager to work on curriculum making or revision. Two courses of action are now open to him. First, he can announce that the curriculum is satisfactory "as is." Second, he can commend the teachers for their interest in the improvement of the curriculum and set them to work making new outlines. The former policy of inactivity would check their enthusiasm and compel them to accept as perfect a program which every one recognizes as being honeycombed with imperfections; the latter would encourage them to proceed further with their studies and research in the interest of educational progress. Fortunately, the wise superintendent of Blanko chooses the latter method and makes use of the talent available in his own system for the reorganization of the curriculum.

What happens? The school system is favored with an improved course in arithmetic and, better still, secures some up-to-date tools of instruction for the use of the pupils and teachers. Is the result merely amusing? No. In the interest of better education, it constitutes a real advance over what might have been the situation.

In the case of Imperia, cited also by Dr. Whipple, the board of education exhibits poor judgment by appointing some incompetent teachers to serve as members of the spelling committee. However, are we to believe that poor judgment is never shown by the gods who, from their cloisters, would make the curricula for the use of the nation's schools? Further, if anything so grotesque as the spelling list mentioned were offered in the average school system, an open storm of disapproval would greet its arrival. (As far as the text-book publishing houses are concerned, they are definitely committing themselves to the publication of such books as are based on scientific investigation. The flood of offerings makes this discrimination not only possible but essential.)

Again, what is the result in Imperia? Even if the picture were as bad as painted—and this is quite impossible—the ultimate outcome would still be good. The bungling of the committee would certainly serve to focus the attention of the teachers on a pseudo spelling list and presently bring about not a return to the former but a distinct advance in the word lists and methods of instruction employed.

No, curriculum making by the teachers, at its worst, has not torn down the educational structure; neither has it brought about the disorganization which the "viewers with alarm" would have us see as the sole result. Rather, the widespread activity of the teachers—admitted that some of this activity is misdirected—has served to turn the spot-light of scrutiny on the old methods and materials which were formerly used without questioning; it has motivated study in the field of the curriculum and has helped to reveal to the teachers some idea of what the new may accomplish. At its worst, curriculum making by the teachers has given to the school systems generally some sense of discrimination and evaluation; at its best, it has brought about more progress and interest in teaching than could otherwise have come from a half century spent in accepting, placidly, the directions and formulas prepared by the professional curriculum maker.

The entire question reduces itself to one basic problem: Who should make the curriculum for the schools? Dr. Whipple, by inference, delegates this job to the professional alone, but the writer wishes to record his exception to this view. Curriculum making must be a cooperative undertaking; the professional is frequently out of touch with child life and actual school situations; he knows the subjects but not the objects of instruction. Should the teachers be enlisted in the work of curriculum making?

Yes. The progressive teachers have studied the field; they have an overview of the needs of the schools; they have been in touch with theory without loss of contact with the pupils and classrooms. With the help and guidance which are available in books and articles, the teachers are competent to do the work. Rather than wrecking the machine, the teachers, in the process of curriculum making, are able to become acquainted with the mechanism which they are called upon to operate, to keep in repair and to improve.

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CHICAGO, ILLINOIS

SPECIAL CORRESPONDENCE

HOW DO COLLEGE STUDENTS PREPARE AN ASSIGNMENT?

A GREAT deal of interest is being manifested these days in a consideration of the study habits of college students. Numerous educational institutions throughout the country are endeavoring to investigate and treat this problem. That most college students do not know how to study efficiently has been pointed out by various educators. The purpose of this article is to throw further light on this most important educational problem.

In order to get more direct evidence concerning the methods of study used by college students the writer prepared a questionnaire for a specific group of students enrolled in an undergraduate course in educational psychology at the University of Iowa during the spring of 1929. The questionnaire was divided into two sections. The first section dealt with study procedure, while the second section was a brief objective test over the content of the assignment. One week after the start of the semester, and after the students had had ample time to prepare their first assignment in the course, the questionnaire was filled out. It was made clear to the students that the information given on the questionnaire would have absolutely no effect on their standing in the course.

The replies were classified into three main types of study procedures: (1) those who read the chapter only once, (2) those who read the chapter twice (3) and those who followed neither of these two procedures. Variations under each type of study were then listed and the frequency of each variation noted.

A. Read chapter once.

1. Read chapter once: (1)
2. Read chapter once, make rough outline: (2)
3. Read chapter once, then answer questions: (18)
4. Read questions first, then read chapter, then answer questions: (5)
5. Read chapter, then underline important parts: (2)
6. Read chapter, then underline important parts, then answer questions: (2)
7. Read once taking casual notes, then answer questions: (2)
8. Read once, memorizing important parts: (1)
9. Read once, outlining, then study outline and answer questions: (1)
10. Read each topic carefully, then attempt to recite to myself what I have learned: (1)

B. Read chapter twice.

1. Read slowly, then again rapidly: (1)
2. Read slowly, then again rapidly keeping questions in mind: (1)
3. Read slowly, then again rapidly answering the questions: (2)
4. Read once, marking important facts, then reread immediately: (1)
5. Read once, marking important facts, then reread several hours later: (1)
6. Read once, then again several hours later answering questions: (1)
7. Read once, then read questions, then read again answering questions: (1)
8. Read once carefully, then review topic subheads briefly: (2)
9. Read rapidly once, then reread spending time on hard parts: (2)
10. Read once answering questions, then reread important paragraphs and phrases: (1)
11. Read once, reread taking notes, answer questions: (2)

C. Miscellaneous.

1. Read by paragraphs—reread if not understood: (1)

2. Read three or four times, each time more slowly: (1)
3. Answer questions, paying little attention to other parts of the chapter: (1)

An inspection of the outline shows that twenty-four different study procedures were used by these sixty students. The numbers in parentheses following each study procedure indicate the extent to which that particular procedure was followed by the members of the class. Attention is called to the fact that only a few of these students follow a procedure which in any way resembles those set up by Whipple, Book and others.

The second section of the questionnaire included a few questions for the purpose of testing the group over the chapter. That most of the students do not adequately prepare such an assignment is indicated by the percentage of correct replies which were received for the following questions:

1. Who is the author of your text-book?
   95 per cent. gave the correct response.
2. What is the title of the book?
   63 per cent. gave the correct response.
3. What is the title of the chapter you have just studied?
   Only 15 per cent. could answer this correctly.
4. Name the five main divisions of the chapter.
   1.5 per cent. gave all five; 6 per cent., four; 12 per cent., three; 16.6 per cent., two; 12.1 per cent., one, and 51.5 per cent. were unable to name a single one.

More specific questions over the details of the chapter showed that few of the students had mastered the material in the assignment.

In conclusion it may be said that the evidence presented in this study indicates: (1) That college students use a large variety of study procedures in preparing assignments; (2) that comparatively few students follow study procedures which in any way resemble those recommended by authorities; (3) that the average student can recall only a few of the main points discussed in an average text-book assignment.

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QUOTATIONS

PROFESSOR STRAYER AND THE EMERGENCY COMMISSION[1]

PERHAPS none of the many contributions that Dr. Strayer has made to the development of American education will, in the last analysis, be more significant than his work as chairman of the emergency commission of the National Education Association. This commission was appointed in 1918 to coordinate the varied types of war-time service that had been assigned to the public schools; to find ways and means of solving other serious problems which the schools were facing, the most significant of which was an alarming shortage of teachers; and to study the relation of the educational system to certain outstanding weaknesses in our national structure which the war crisis had brought into high relief—the prevalence of relatively high ratios of illiteracy in many of the states, the need of a greatly extended program of health education, the presence in our midst of a large foreign-born population many elements of which were quite unassimilated, and the glaring inequalities of educational opportunity as between the rural and the urban areas, and in general between the wealthier and the poorer communities.

Dr. Strayer's initiative and leadership were primarily responsible for the proposals of the commission looking toward a solution of these problems. The most comprehensive of the proposals was a plan for federal participation in the encouragement and support of public education in the several states, with generous subventions for the reduction of illiteracy, the Americanization of the foreign-born, the development of health programs, the better training of teachers, and the equalization of educational opportunity especially through the improvement of the rural schools. Bills embodying this plan were before Congress for several years following the war, and while these bills failed of enactment into law, the efforts of the commis-

[1] Extract from remarks by Professor William C. Bagley at the dinner in honor of Professor George D. Strayer, May 3, 1930, at Teachers College, Columbia University.

sion had far-reaching effects in three very important directions.

In the first place, the commission's program of national legislation unified, for the first time in our history, the teaching profession of the United States. The National Education Association, which had only 10,000 active members in 1918, increased its membership to more than 100,000 in less than five years, and the number is now well past 200,000. When the commission was organized, the association's paid staff consisted of a secretary and two clerical assistants. To-day the headquarters staff numbers nearly two hundred and includes field secretaries, legislative secretaries, editors and highly trained research workers.

In the second place, the development of the National Education Association, stimulated by the program of the emergency commission, in its turn stimulated the development of professional organization in the several states. These are now affiliated with the national organization and, like the latter, most of them now have paid secretaries and several support well-organized research bureaus. In the aggregate these state organizations enroll more than three fourths of all the public-school teachers of the country.

In the third place, while the legislation which the commission sought was not enacted by Congress, the continued discussion of the various problems involved has had a great deal to do with the marked progress that many of the states have made toward correcting the weaknesses to which the commission repeatedly called attention. Most notable, perhaps, has been the progress that the past ten years have witnessed in the training of teachers. In 1919, very few states could report that as many as one half of their public-school teachers represented the standard of training generally regarded as the minimum in all enlightened countries. To-day in probably a majority of the states a majority of the teachers have reached this standard, and at least one fourth of the states are rapidly approaching the day when no single teacher will be recorded as below standard in this important particular. Marked progress has also been made in the development of health education and in many communities in the reduction of illiteracy.

It is true that all of this can not be justly attributed to the work of the emergency commission, but it was the commission that first set forth clearly the needs and formulated a program for meeting them. It was the commission that kept these needs persistently before the public until other organizations took them up. And it was Dr. Strayer whose vision and leadership made it possible for the commission to do these things.

REPORTS

LIBRARY DEVELOPMENT IN THE SOUTH

DEVELOPMENT in the field of education in the South since 1900 has been nothing short of spectacular. The increase in expenditures for the public schools in a state like North Carolina from $1,000,000 in 1900 to $40,000,000 in 1929; the growth of the appropriation of the state university from $25,000 to $880,000 within the same period; the building of an entire university plant such as that of Duke University, and the enrolment of 110,000 pupils in the high schools as against approximately 2,000 in the city graded schools (there was no state system of public high schools until 1907) give evidence of the remarkable quantitative development which has taken place in education throughout the entire South.

The next major educational development in the South, now getting under way, is to be of a qualitative sort, and is to come through the multiplication of library facilities. That this is true is evidenced by five significant facts, as follows:

(1) The second Southern Conference on Education, held at the University of North Carolina from October 19 to 22, 1929, was devoted exclusively to the consideration of the library as an educational instrument of primary importance. For four days educators and librarians from the South, with leaders in these fields from all parts of the nation, discussed the various phases of library activity and formulated plans for the immediate extension of library facilities in every southern state.

(2) At the meeting of the Association of Col-

leges and Secondary Schools of the Southern States at Lexington, Kentucky, from December 2 to 5, both the commissions on higher education and secondary education adopted reports of special committees raising the library requirements of all colleges and high schools having membership in the association, to the end that all instruction might be greatly supplemented by the extensive use of library materials.

(3) At the meeting of the Southeastern Library Association at Chapel Hill, North Carolina, in October, formal announcement was made by the Rosenwald Fund that it had set aside $500,000 for the development of county libraries in the South, with service to all people, rural and urban, Negro and white. Announcement was also made of grants to Davidson and Mecklenburg Counties in North Carolina for the promotion of this work, and of plans for similar grants to counties in other states. The fund has placed a library adviser in the southern field, and the Southeastern Library Association has a special committee to cooperate with the adviser in the general work of promotion.

(4) Notable progress was made during 1929 in providing facilities for the training of librarians, particularly school librarians. The Carnegie Corporation announced the gift of $100,000 to the University of North Carolina for the establishment of a library school; plans for the increased support of the library school of Emory University were successfully inaugurated; new library schools in connection with Peabody College at Nashville, Tennessee, and North Carolina College for Women were gotten well under way, and departments of library science for winter or summer courses in every southern state enrolled a total of 900 to 1,000 students during the year, as against 100 in 1925.

(5) Library building has been notable. The dedication of the new $625,000 building at the University of North Carolina was accompanied by the announcement of gifts for library purposes of $150,000. Duke University is now completing a building that will accommodate 500,000 volumes. Richmond, Virginia, is erecting a $500,000 building. Fisk University and Atlanta University, for Negroes, are projecting $400,000 and $500,000 library plants, and throughout the entire South book funds, for public and college libraries alike, are being decidedly increased, Duke University having led the field with the expenditure of approximately $100,000 during the past academic year.

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EDUCATIONAL RESEARCH AND STATISTICS

AN EXPERIMENT IN SELF-DIRECTED EDUCATION

THE primary purpose of this experiment was to take a group of delinquent children and see if they could be adjusted to the life of the community. This was to be accomplished by careful study of the child's home, neighborhood, school and physical conditions. The family history of the child was to be supplemented by careful study from the psychological, educational and medical points of view. In this paper we are concerned only with some of the facts discovered in the educational study of the child.

The writer went through 2,600 family case records of the Juvenile Court and picked a group of the "worst" boys who were to be found in a city of 300,000 population. To this group the principals of the schools and the attendance department added those considered their most serious problems. The group ranged in age from eight to nearly sixteen, in IQ from 60 to 120, and included colored, Polish, Hungarians and native white Americans.

The experiment was started in January, 1924, and lasted until the end of the school semester at the beginning of June. The children were tested at the beginning of the period and again near the end. The two forms of the Stanford Achievement Test were given to determine educational status. Form A was given in January and Form B in May.

All the children were brought to a central technical high school where a room was parti-

tioned off for their especial use. This room was equipped with desks and blackboards such as are found in the ordinary classroom. In addition there was a large table near the front of the room. On this table were placed a large collection of supplementary readers and story-books, as well as a supply of text-books for the various grades.

No formal instruction was given. In the beginning of the experiment the children were told to keep busy and refrain from annoying any of the others. This was the only rule that was enforced. Otherwise they were permitted to occupy themselves as they saw fit. The instructor from time to time passed from one to another to see what was being done. One child might be busily occupied in copying a picture from one of the books; another might be reading a fairy story; another occupied with a problem in arithmetic; another reading a history; others might be looking up places on a geography map, and still others would be studying about some machinery. Whenever a child was found manifesting an interest in some particular thing opportunity and encouragement were given him to develop that interest. This might mean that arrangements had to be made for art work in the regular art classes of the high school. The child with an interest and aptitude for mechanical work was given an opportunity to do this sort of work in the high-school machine shop. The same was true for those interested in automobile mechanics, woodworking, printing and the like. Arrangements were made for recreation at the neighboring Y. M. C. A., and a period was devoted to this once or twice a week.

Each child was told of his accomplishment on the achievement test and encouraged to make up for any deficiencies, but he was not forced to devote his time to these. It was a revelation to the writer how these children turned naturally from one subject to another. A boy might spend an entire day on some book that he was reading. The next day he might devote to arithmetic. One ten-year-old became interested in working square root problems and worked all of these he could find in the arithmetic book. A colored boy became interested in history and read all the histories we could supply. His accounts of interesting historical events kept the entire group keenly interested as he related them. Whenever one of the boys found something in his reading which he felt would prove interesting he was permitted to tell it to the group. However, they were not required to pay attention to the speaker if they wanted to continue what they were doing.

Although a total of twenty-six boys were in attendance in this special experimental group for shorter or longer periods, only thirteen were present for both the January, Form A, and May, Form B, Stanford Achievement Tests. This was due to out-of-school adjustments, transfers and other causes. Social adjustment was given first importance, and completeness of experimental records was not allowed to prevent placing a boy on a farm, for example, if this met a pressing need.

The table which follows gives the results of this method of procedure for the four-month period in terms of subject age at the beginning and end of the period for the thirteen boys who had the two forms of the achievement test in January and May.

It will be seen from the table that there was a gain in subject age of from six to fifteen months. The gain was in the following descending order: Language age had a gain of slightly over fifteen months on the average for the group; arithmetic age gained an average of fourteen months; reading age showed a gain of eleven months; science age gained eleven months; dictation age gained almost nine months, and history and literature age gained slightly over six months. The average gain in educational age for the group was slightly over twelve months. The gain in mental age for the entire group averages just over three months.

It will be noticed that the accomplishment quotients for all the children were well up toward 100 at the beginning of the period. Nine of the thirteen cases had an accomplishment quotient of over 100 at the beginning of the period. At the end of the period every member of the group had an accomplishment quotient of 100 or over. The average gain in accomplishment quotient for the group was approximately 5½ points.

The three boys having the smallest gain in educational age were for one reason or another present in the special group a much shorter

TABLE I

Subjects	S.B.	V.D.	M.H.	R.J.	M.L.	E.M.	F.N.	J.M.	C.H.	S.S.	H.S.	E.S.	E.W.	Average increase
Reading age														
January	10–9	9–9	11–10	15–8	13–7	13–3	15–0	11–4	15–7	15–7	12–5	12–11	12–8	
May	12–7	9–10	11–3	16–11	14–4	17–5	15–8	12–7	16–7	15–7	12–1	14–5	13–2	
Increase	22	1	−7	15	9	50	8	15	12	0	−4	18	6	11.2
Arithmetic age														
January	14–6	11–0	12–7	16–0	17–2	14–4	14–10	10–1	13–11	16–0	14–4	11–11	12–2	
May	15–0	10–6	13–7	16–6	17–4	18–4	16–0	11–4	15–2	17–10	15–0	13–9	14–2	
Increase	6	−6	12	6	2	48	14	15	15	22	8	22	24	14.5
Science age														
January	11–5	10–7	11–2	13–6	11–0	13–7	13–1	11–6	14–9	16–7	11–7	12–1	12–0	
May	12–0	9–10	11–0	14–6	12–1	18–2	14–5	12–3	15–7	17–6	11–3	12–9	13–5	
Increase	7	−9	−2	12	13	55	16	9	10	11	−4	8	17	11.
Hist. and Lit. age														
January	8–8	8–6	10–2	16–1	14–3	13–10	15–2	9–3	15–3	17–2	11–5	14–7	10–11	
May	10–6	9–1	10–2	16–4	16–0	12–6	15–9	11–1	15–4	17–7	12–2	14–1	11–4	
Increase	22	7	0	3	21	−16	7	22	1	5	9	−6	5	6.2
Language age														
January	13–5	9–6	10–7	15–3	9–10	11–10	15–6	10–10	14–4	15–6	10–6	11–3	12–7	
May	12–7	10–2	11–4	16–0	13–5	14–6	15–6	11–4	16–9	16–0	11–4	15–0	13–9	
Increase	−10	8	9	9	43	32	0	6	29	6	10	45	14	15.5
Dictation age														
January	13–2	8–10	10–9	14–4	13–0	12–11	14–10	10–6	13–0	14–9	12–7	12–1	12–11	
May	13–1	10–1	11–4	16–0	14–3	12–7	15–2	10–6	15–0	16–4	12–7	13–1	13–3	
Increase	−1	15	7	20	15	−4	4	0	24	19	0	12	4	8.8
Educational age														
January	12–2	9–10	11–6	15–4	14–1	13–4	14–9	10–8	14–3	15–10	12–7	12–5	11–3	
May	12–11	10–1	11–7	16–3	15–0	16–1	15–6	11–5	15–9	16–10	12–10	13–9	13–3	
Increase	9	3	1	11	11	33	9	9	18	12	3	16	24	12.2
Mental age														
January	11–4	10–0	11–0	14–10	12–8	13–1	15–1	9–8	14–8	16–4	10–7	12–2	11–1	
May	11–7	10–0	11–3	15–2	13–0	13–4	15–5	9–11	15–2	16–4	10–10	12–6	11–4	
Increase	3	0	3	4	4	3	4	3	6	0	3	4	3	3.2
Accomplishment quotient														
January	107	98	104	103	111	102	95	110	98	94	119	102	101	
May	111	100	103	107	115	110	101	115	104	103	119	110	117	
Increase	4	2	−1	4	4	8	6	5	5	9	0	8	16	5.4

time than the others. Mention has already been made of the primary object of the experiment, which was to bring about a social adjustment of the boy. The educational work was required to give way to this objective whenever it seemed to conflict. For example, V. D., who has a gain of three months in educational age, was found to have exceptional mechanical aptitude and was placed in the machine shop for most of the time. He was almost sixteen years of age, and it was deemed desirable to give him as much training along the line of his special aptitude as possible. After the first few weeks he merely reported to the instructor in the spe-

cial room and to the gym classes at the Y. M. C. A. The remainder of his school time was spent in the machine shop. M. H. was found to be in need of special medical attention and was placed in an institution where this could be given. His attendance in the special class was limited to a short time at the beginning and end of the period. His gain in educational age was only one month. H. S., who has a gain in educational age of three months, was found to be living under home conditions that required that he be placed in an institution for a part of the time. This interfered with his attendance in the special room.

If these three boys who attended irregularly are omitted some difference will be noted in the general averages. The language and arithmetic ages both increase by 17.4 months during the four-month period. Science age increases by 15.8 months. This is closely followed by reading age, which has an average increase of 15.5 months for the group. Educational age increases on the average 15.2 months for the entire group, notwithstanding the relatively lower increase in history and literature and dictation. Dictation shows an increase of 9.3 months, while history and literature increases on the average only 6.4 months.

This experiment is interesting chiefly for the fact that it seems to indicate that a group of delinquent boys of varying ages and capacities will, if given an opportunity and supervision, improve more in educational age when left alone than they will under ordinary schoolroom conditions with formal instruction. Another interesting conclusion is that the gain in educational age will, in general, be spread over all the subjects of the curriculum. Many of them show special preference for one or another type of subject-matter, but there is a tendency to turn from one to another after a period of time. Many of the boys went to the blackboard to work their arithmetic problems primarily for the activity involved. They made up certain games involving arithmetical processes, such as addition, subtraction, multiplication and division. For example, two or more boys would start at a given signal and add by seventeens to a thousand. The rivalry was often intense, and for some of the boys the increase in speed and accuracy in the fundamentals was striking. The reports of the various boys on interesting material read would stimulate other boys to read the same thing or something of like nature. It is quite possible, too, that the desire to obtain recognition from their fellows motivated them to do tasks that would not have been otherwise attempted.

Another interesting fact is that all the boys had an accomplishment quotient very near the normal. Their chronic truancy, theft and incorrigibility had not prevented them from acquiring a rather high percentage of what their intelligence made possible. Since their intelligence quotient averaged 82 it will be seen that they had probably attended school longer than the average boys of their age. This is true even if their chronic truancy is taken into account. No doubt this accounts for the high accomplishment quotient.

The most striking fact is that such marked improvement could and did result from such informal, self-directed activity. The writer was not greatly interested in the educational development of these boys. The problem of social adjustment entirely outweighed it in his estimation. He used the special room merely to get better acquainted with the individual boys and to keep them from violating the compulsory attendance law. Whether they learned reading, arithmetic, geography, history and the other subjects was considered relatively unimportant. The fact that, if we exclude the three present only a short time, the group made an average gain of 15.2 months in educational age is surprising. It should be remembered, too, that these boys spent less time in the classroom and more in the shops, at the gymnasium and on the playground than is usually the case.

In accounting for this increase in educational achievement the writer can only surmise that different conditions, a personal interest on the part of the supervisor in each child's home conditions, neighborhood, recreation, health and the like as well as an interest in the child individually may have stimulated the child. The reasons for the increase would involve more discussion than the limits of this paper seem to warrant. A description and discussion of each child's hereditary and environmental influences would be necessary.

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